

Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of the Claims:

- 1 **Claim 1 (previously presented):** A method for the
2 determination of an acoustic impedance Z , comprising the
3 steps of
- 4 - arranging a probe with a means for acoustic
5 stimulation and a microphone at the area to be
6 measured;
 - 7 - sending out acoustic signals over said means and
8 receiving again over the microphone;
 - 9 - transforming the received signals by the microphone
10 into electrical signals for input to an analysis
11 unit, in which the amount of the impedance Z will
12 be determined;
 - 13 - inputting a previously defined stimulation into a
14 twoport chain transfer matrix as a calculation
15 base for the impedance Z ,
 - 16 - wherein the voltage ratio between the stimulation
17 and the impedance is described as a dimensionless
18 transfer function in a form of a complex function
19 of the stimulation frequency;
 - 20 - generating a series of acoustic calibration signals
21 by a number of known acoustic impedances covering
22 different calibration scopes by means of the
23 defined stimulation;
 - 24 - recording the calibration signals received by the
25 microphone and merging the electric values

26 together with the respective voltage values of
27 the stimulation for the evaluation of the results
28 of the respective transfer functions;
29 - merging together the transfer functions of the
30 calibration signals into a an over-determined
31 linear system of equations and solving the system
32 of equations for calculating two coefficients;
33 and
34 - determining the impedance Z , calculated by
35 evaluating the transfer function under the
36 defined stimulation by use of the two
37 coefficients.

1 **Claim 2 (original):** Method of claim 1 wherein a
2 loudspeaker is used as a mean for the acoustic stimulation.

1 **Claim 3 (original):** Method of claim 1 wherein the
2 over determined linear system will be solved in terms of
3 minimum squares.

1 **Claim 4 (original):** Method of claim 1 wherein at
2 least two different impedances are used.

1 **Claim 5 (previously presented):** Method of claim 1
2 wherein a combination of hollow bodies and small tubes with
3 defined dimensions and known impedances are used as
4 calibrating impedances.

1 **Claim 6 (previously presented):** Method of claim 1
2 wherein a frequency generator is used for the stimulation
3 by generating a broad band signal of white noise.

1 **Claim 7 (original):** Method of claim 1 wherein the
2 transfer functions will be calculated by the division of
3 the measured auto power spectrum of the stimulation through
4 the average cross power spectrum between stimulation and
5 impedance to be measured.

1 **Claim 8 (previously presented):** Method of claim 1
2 wherein two series connected twoport chain matrices are
3 used, wherein the microphone is arranged between the output
4 of the first twoport and the input of the second twoport.

1 **Claim 9 (previously presented):** Method of claim 8
2 wherein the elements of the two chain matrices are reduced
3 to three base parameters, which are evaluated by
4 measurements of at least three calibration impedances with
5 known impedances and the respective solution of the over
6 determined linear system of equations to further determine
7 the impedance to be measured by measuring of the transfer

8 function as a division between the stimulation and the
9 microphone signal by use of the base parameters.

1 **Claim 10 (previously presented):** Method of claim 9
2 wherein the linear system of equations will be solved in
3 terms of minimum squares.

1 **Claim 11 (previously presented):** Method of claim 1
2 wherein an acoustic resistor is arranged between the
3 stimulation and the microphone.

1 **Claim 12 (previously presented):** Method of claim 11
2 wherein the sensitivity of acoustic resistor is optimized
3 with respect to microphone errors.

1 **Claim 13 (previously presented):** Method of claim 1
2 wherein a frequency and/or impedance specific weighting of
3 the linear systems of equation is performed.

1 **Claim 14 (previously presented):** A method for the
2 determination of the acoustic impedance of cavities, such
3 as an ear in connection with a hearing aid, comprising the
4 steps of

- 5 - arranging a probe with a microphone and a speaker at
- 6 the area to be measured;
- 7 - sending out acoustic signals over the speaker into
- 8 the cavity and receiving again over the
- 9 microphone;
- 10 - transforming the received signals by the microphone
- 11 into electrical signals and transferring them to
- 12 an analysis unit;
- 13 - using a previously defined stimulation input to a
- 14 twoport chain transfer matrix as a calculation
- 15 base for the impedance Z ,
- 16 - wherein the voltage ratio between the stimulation
- 17 and the impedance is described as a dimensionless
- 18 transfer function in a form of a complex function
- 19 of the stimulation frequency;
- 20 - generating a series of acoustic calibration signals
- 21 by a number of known acoustic impedances covering
- 22 different calibration scopes by means of the
- 23 defined stimulation;
- 24 - recording the calibration signals received by the
- 25 microphone and merging the electric values
- 26 together with the respective voltage values of
- 27 the stimulation for the an evaluation of the
- 28 results of the respective transfer functions;
- 29 - merging together the transfer functions of the
- 30 calibration signals into an over-determined
- 31 linear system of equations and solving the system
- 32 of equations for calculating and storing two
- 33 coefficients; and
- 34 - determining the impedance Z to be calculated by
- 35 evaluating the transfer function by use of the
- 36 two coefficients.

1 **Claim 15 (previously presented):** Method of claim 14
2 wherein two series connected twoport chain matrices are
3 used, and wherein the microphone is arranged between the
4 output of the first twoport and the input of the second
5 twoport.

1 **Claim 16 (currently amended):** An apparatus for the
2 determination of an acoustic impedance comprising a probe,
3 a microphone, ~~and a speaker, and an acoustic resistor~~
4 wherein said microphone is connected to said speaker via
5 said channel, and wherein said channel has an exit opening
6 with said acoustic resistor between said speaker and said
7 exit opening. ~~an acoustic resistor is arranged between the~~
8 ~~speaker and an exit opening in a connecting channel to the~~
9 ~~microphone.~~

1 **Claim 17 (previously presented):** Apparatus of claim
2 16 wherein a connecting channel is built up within the
3 probe between the speaker and the microphone, leading
4 subsequently to the microphone into an adapter, which is
5 arranged in an unlockable fashion with a housing of the
6 probe.

1 **Claim 18 (previously presented):** Method of claim 1
2 for measuring the impedances of hearing devices, part
3 systems of hearing devices, shells of hearing devices, and
4 vents of hearing devices.

1 **Claim 19 (previously presented):** Method of claim 14
2 for measuring the impedances of hearing devices, part
3 systems of hearing devices, shells of hearing devices, and
4 vents of hearing devices.

1 **Claim 20 (original):** Method of claim 1 for measuring
2 the impedances in the field of quality control, preferably
3 the quality control of hearing device transducers, porous
4 bodies, membranes and textiles.

1 **Claim 21 (previously presented):** Method of claim 14
2 for measuring the impedances in the fields of quality
3 control of hearing device transducers, porous bodies,
4 membranes, and textiles.

1 **Claim 22 (previously presented)** Apparatus of claim 16
2 for the measuring of the impedances of hearing devices,
3 part systems of hearing devices, shells of hearing devices,
4 and vents of hearing devices.

1 **Claim 23 (previously presented):** Apparatus of claim
2 17 for the measuring of the impedances of hearing devices,
3 part systems of hearing devices, shells of hearing devices,
4 and vents of hearing devices.

1 **Claim 24 (previously presented):** Apparatus of claim
2 16 for measuring the impedances in the field of quality
3 control of hearing device transducers, porous bodies,
4 membranes, and textiles.

1 **Claim 25 (previously presented):** Apparatus of claim
2 17 for measuring the impedances in the field of quality
3 control of hearing device transducers, porous bodies,
4 membranes, and textiles.

1 **Claim 26 (currently amended):** An apparatus for the
2 determination of an acoustic impedance Z comprising:
3 a probe;
4 a microphone;
5 a speaker;
6 an acoustic resistor arranged between the speaker and
7 an exit opening within a connecting channel connecting to
8 one of the microphone and an exit of the probe; and

9 an analysis unit for receiving electrical signals from
10 the microphone, and for determining an impedance Z , wherein
11 a series of acoustic calibration signals of a number
12 of known acoustic impedances covering different calibration
13 scopes are generated by means of a predefined stimulation
14 for output by the probe for reception by the microphone.